

SCINTIGRAPHIC ILLUSTRATION OF ALIMENTARY TRACT DUPLICATION IN A PATIENT SUSPECTED OF MECKEL'S DIVERTICULUM - A CASE REPORT

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INTRODUCTION

Alimentary Canal Duplication (ATD) is a rare developmental anomaly of the gut with reported incidence of 1 in 4500¹. It may occur anywhere in the gut from thoracic part of esophagus to midgut and hindgut and may involve urinary and genital systems as well². However, ileum is the most common site accounting for 44% of cases³. These lesions characteristically consist of well developed smooth muscle coat, mucosa originating from any part of the gut and anatomy close to any of the major portions of gastrointestinal tract⁴. The clinical picture depends upon the site and size of duplication,⁵ ranging from completely asymptomatic to malena or rectal bleeding and sometimes to severe intestinal obstruction, intussusceptions and volvulus that may prove to be life threatening. Duplicate segments are present along the normal segments of the gut, sometimes sharing the same wall and may or may not communicate with the lumen.

CASE REPORT

Our patient, a six month old baby boy, presented with abdominal discomfort for last 2 months along with passage of black colored stool for one and a half month and fresh bleeding per rectum for last 10 days. On routine investigations his haemoglobin (Hb) was persistently low for which he had to undergo multiple transfusions. His stool was found to be positive for occult blood. However, upper GI endoscopy was unremarkable. Ultrasound scan showed dilated gut loops with inner echogenic mucosa and outer hypoechoic smooth muscle coat. Barium meal and follow through revealed dilated loops of

small gut predominantly occupying left hypochondrium and left side of abdomen. CT scan also showed thick walled, dilated gut loops. Tc-99m pertechnetate scan was performed for suspected Meckel's diverticulum which revealed

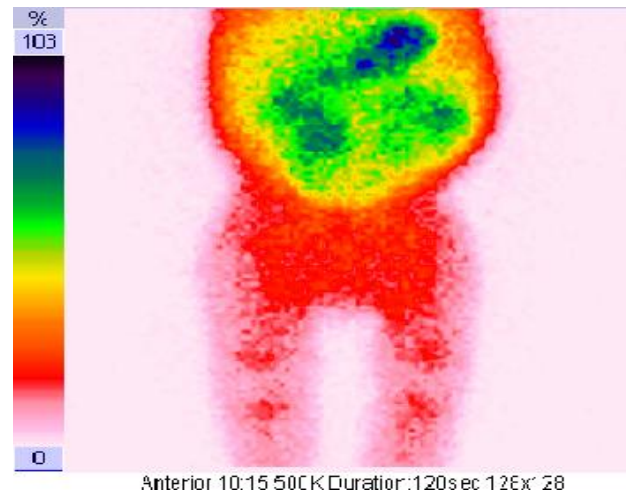


Figure-1: Anterior abdomen image at 5 min showing gradual background clearance and localized radiotracer concentration in the stomach and ectopic gastric mucosa in the abdomen.

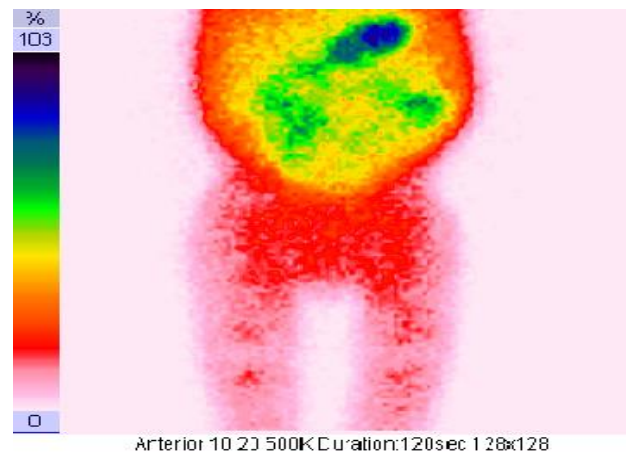


Figure-2: Anterior abdomen image at 30 min showing Tc-99m pertechnetate retention in the stomach and ectopic gastric mucosa in the abdomen.

abnormally increased tracer concentration in the

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left lower abdomen suggesting heterotrophic gastric mucosa. The images at different time intervals are given in fig 1,2 and 3. Based on the symptoms and investigations, the differential diagnosis of Meckel's diverticulum and alimentary canal duplication cyst was made.

DISCUSSION

ATD was first introduced by Fitz in 1844 as "persistent omphalomesenteric remnants"⁶. This was followed by more detailed research by Ladd in 1937 who introduced the term "duplication of the alimentary tract"⁷. Gross in 1950s suggested that nomenclature of duplication should be based on anatomical location and not on the histologic appearance⁸. Potter was among the pioneer workers who reported 2 cases in around 9000 fetal and neonatal autopsies⁹.

Many researchers have tried to propose the mechanism behind occurrence of ATD. 'Split notochord theory' proposes neural tube traction mechanism behind enteric duplication associated with vertebral anomalies. 'Partial twinning' can be responsible for some duplications of the foregut and hindgut associated with duplication of other paired structures such as genitals and urinary tract. 'Persistence of embryonic diverticula' can also result in enteric duplication cysts especially in small intestine. 'Aberrant luminal recanalization' has been discussed as a possible cause in which a portion of alimentary canal may get solidified followed by recanalization⁴. 'Adherence of loops' can occur due to external pressure on adjacent gut loops resulting in side by side duplication. Histologically ATDs are cystic, spherical or tubular structures, attached to the gut wall and lined by epithelium originating from any part of the gut¹⁰.

Clinical presentation of ATD varies widely. Some patients remain asymptomatic till the time they are accidentally diagnosed on routine scans or as part of investigations for some other illness¹¹. Presentation usually depends upon the location of lesion. Gastric duplications usually present early with complaints of poor feeding, failure to grow, vomiting, hematemesis and malena¹².

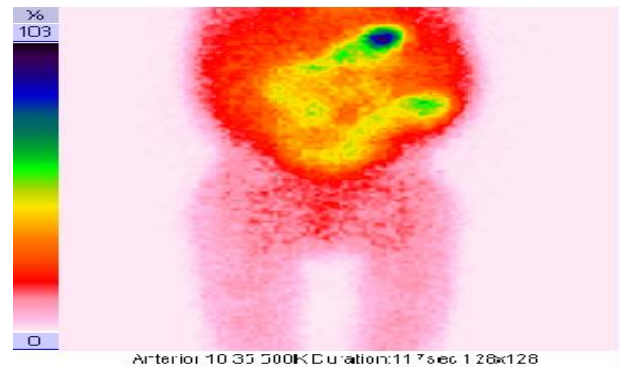


Figure-3: Anterior abdomen image at 45 min showing Tc-99m pertechnetate concentration in the stomach and ectopic gastric mucosa in the abdomen.

Duodenal duplications may also contain gastric mucosa that may lead to peptic ulcerations. They may take origin from bile duct or pancreas hence sometimes associated with pancreatitis. In small intestinal duplications, symptoms depend upon size and site of duplicate tissue and type of epithelium¹³. Intussusceptions and volvulus can occur with small cystic lesions while large tubular lesions can lead to intestinal obstruction. Gastric mucosa can also be found leading to symptoms of Meckel's diverticulum. There can be multiple small lesions occurring simultaneously³. Colonic duplications may be asymptomatic or present as abdominal mass. Just like small intestine, colonic duplications may occur as multiple small duplications¹⁴. Colonic duplications can cause compression, volvulus and intussusceptions. Rectal duplication presents as bleeding per rectum, hemorrhoids, fistula in ano or anal prolapse¹⁵.

Prenatal ultrasound scans can be used to diagnose ATD during gestation⁴. Ultrasonography and contrast-medium examinations are most commonly employed for detection of ATD. CT scan and MR imaging can be helpful in difficult cases due to their multi planar approach¹⁶. The diagnosis is however, not usually confirmed before surgery⁴. Ultrasound scans are useful in detection of duplication of gut¹⁷ with added advantage of giving information

on genitourinary system. Contrast studies may point out the mass effect by highlighting misaligned and mal-positioned gut loops¹⁸. CT scans can be employed in diagnosis of duodenal lesions¹⁹. Tc-99m pertechnetate scans are very helpful in localizing heterotrophic gastric mucosa²⁰. Laparoscopy can be useful in patients with recurrent abdominal symptoms⁴.

Management of ATD is mainly surgical by excision of extra gut loops. Recently laparoscopic excision is gaining popularity among the surgeons and may be an option for various pediatric conditions⁴.

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